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# 2007 SMALL GAME HARVEST SURVEY

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## Abstract

*A survey was completed to estimate the number of people hunting small game, their days afield, and harvest during the 2007 hunting seasons. The survey also was used to investigate hunter satisfaction, compliance with the Harvest Information Program (HIP), and to estimate proportion of hunters using dogs. In 2007, 293,662 people purchased small game hunting licenses, a decrease of about 1% from 2006. An estimated 188,297 people actually hunted small game species in 2007, a decrease of about 9% from 2006. Small game hunters most often sought ruffed grouse, tree squirrels, and cottontail rabbits. Fewer people hunted ring-necked pheasant (-19%), snowshoe hare (-30%), and squirrels (-15%) in 2007 compared to 2006. Hunting effort statewide declined significantly among hunters pursuing pheasants (-40%) and squirrels (-24%). Harvest also decreased significantly statewide for pheasant (-31%) and squirrels (-29%). Compared to 2006, a similar proportion of small game hunters in 2007 were satisfied with their overall small game hunting experience (66% versus 63% satisfied). Moreover, similar proportions of small game hunters were satisfied with the amount of small game seen (45% versus 44%) and small game harvested (36% both years). In 2007, 90% of migratory bird hunters had registered with HIP. About 97% of the waterfowl hunters and 83% of the woodcock hunters had registered with HIP. About 42% of active small game hunters used dogs during 2007. Highest use of dogs occurred among hunters pursuing pheasant (64%), woodcock (57%), and quail (52%).*

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## INTRODUCTION

The Natural Resources Commission and the Michigan Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. This responsibility is shared with the U.S. Fish and Wildlife Service (USFWS) for the management of migratory species such as woodcock (*Scolopax minor*). Harvest surveys are one of the management tools used by the DNR to accomplish its statutory responsibility. Estimates derived from harvest surveys, as well as breeding bird counts, are used to monitor game populations and help establish harvest regulations.

Since the 1950s, the primary small game species harvested in Michigan have been ring-necked pheasant (*Phasianus colchicus*), ruffed grouse (*Bonasa umbellus*), American woodcock, cottontail rabbit (*Sylvilagus floridanus*), snowshoe hare (*Lepus americanus*), tree squirrels (*Sciurus* spp. and *Tamiasciurus hudsonicus*), and American crow (*Corvus brachyrhynchos*) (Frawley 2007). Most of these animals could be harvested during fall and early winter (Table 1) by a person possessing a small game hunting license (includes resident, nonresident, 3-day nonresident, resident junior, and senior small game hunting licenses). Coyotes (*Canis latrans*) could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). Woodcock hunters were required to register with the National Migratory Bird Harvest Information Program (HIP). Landowners and their families that hunted small game on their property where they resided could hunt without a hunting license, although they still needed to register with HIP if they hunted woodcock.

The HIP is a cooperative effort between state wildlife agencies and the USFWS. It was implemented to improve knowledge about harvest of migratory game birds (e.g., woodcock). Beginning in 1995, any person who hunted migratory game birds in Michigan was required to register with HIP and answer several questions about their hunting experience during the previous year. The HIP provided the USFWS with a national registry of migratory bird hunters from which they can select participants for harvest surveys.

Estimating harvest, hunter numbers, and hunting effort were the primary objectives of the small game harvest survey. This survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to investigate hunter satisfaction with the 2007 hunting season and small game numbers. Small game hunters were also asked whether they hunted with dogs and which species they hunted with dogs.

## METHODS

The Wildlife Division provided all small game hunters the option to report information voluntarily about their hunting activity via the Internet. This option was advertised on the DNR Web site and an email message was sent to small game hunting license buyers that had provided an email address to the DNR (41,523 licensees). Hunters reported species hunted, county hunted, type of land on which hunt occurred (public or private lands), number of days spent afield, and number of animals harvested. In addition, hunters were asked whether they had hunted waterfowl and to rate their overall hunting experience and indicate

their satisfaction with the amount of game seen and amount harvested, and number of days in the hunting season. Hunters were also asked whether they hunted small game using a dog and which species they pursued. Following the 2007 hunting seasons, a questionnaire was sent to 9,998 randomly selected people that were eligible to hunt small game and had not already voluntarily reported harvest information via the Internet. Hunters receiving the questionnaire in the mail were asked the same questions as hunters responding on the Internet.

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, hunters were placed into similar groups (strata) based on their county of residence and whether they had voluntarily reported their hunting activity on the Internet. Residents of the Upper Peninsula (UP), northern Lower Peninsula (NLP), southern Lower Peninsula (SLP), and nonresidents and licensees with unknown residency were grouped into separate strata (Figure 1). Another stratum consisted of hunters that had voluntarily reported their hunting activity on the Internet before the sample for the mail survey was selected. The overall sample consisted of 1,125 people from the UP stratum (N= 33,183), 2,412 people from the NLP stratum (N= 67,576), 6,093 from the SLP stratum (N= 178,089), and 368 people from the nonresident and unknown residency stratum (N=11,406). In addition, 3,408 people that had responded voluntarily via the Internet were part of the final sample. Estimates were derived for each group separately. The statewide estimate was then derived by combining group estimates so the influence of each group matched the proportion its members contributed to the statewide population of hunters. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey were to be repeated.

Coyotes could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). The DNR sells hunting licenses using a statewide automated license sales system. This system allowed the DNR to maintain a central database containing license sales information (e.g., sales transactions) for each license buyer. Using the license sales database, small game hunting license buyers that also purchased a fur harvesters license were identified, and then coyote harvest was estimated separately for small game licensees with and without a fur harvesters license. The license sales database also was used to identify whether small game hunting licensees had registered with HIP. Using this information, estimates of compliance with HIP among small game hunting license buyers hunting migratory species (woodcock and waterfowl) was estimated.

Estimates were derived separately for the UP, NLP, and SLP (Figure 1). Hunting effort and animals harvested from unknown locations were allocated among areas in proportion to the known effort and harvest.

Estimates were subject to both sampling and nonsampling error. When a sample rather than the entire population has been surveyed, there is a chance that the sample estimates may differ from the true population values they represent. The difference, or sampling error, varies depending on the particular sample selected, and this variability was measured by the 95% confidence limit (CL). In theory, this CL can be added and subtracted from the estimate

to calculate the 95% confidence interval. The confidence interval was a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100.

Estimates also were affected by nonsampling error. Nonsampling error can occur for many reasons, including the failure to include a segment of the population, the inability to obtain data from all units in the sample, the inability or unwillingness of respondents to provide data, mistakes made by respondents, and errors made in the collection or processing of the data. It is very difficult to measure this error. Thus, estimates were not adjusted for nonsampling error. Furthermore, harvest estimates did not include animals taken legally outside the open season (e.g., nuisance animals) and by unlicensed landowners and their family that legally hunted on their own land.

Statistical tests are used routinely to determine the likelihood the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially in late April. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 205 people, primarily because of changes in residence. Questionnaires were returned by 5,506 people, yielding a 56% adjusted response rate. In addition, 3,408 people voluntarily reported information about their hunting activity via the Internet before the random sample was selected.

## RESULTS AND DISCUSSION

### License sales and hunter participation

In 2007, 293,662 people purchased small game hunting licenses, a decrease of about 1% from 2006 (Table 2). About 64 ± 1% of the licensees actually hunted in 2007 (Tables 2 and 3), which was lower than estimated in 2006 (70%). An estimated 188,297 people actually hunted small game species in 2007 (excluded people hunting waterfowl only), a significant decrease of about 9% from 2006 (Table 3). About 96% of the active small game hunters were males (Table 3). Hunters most often sought ruffed grouse, tree squirrels, and cottontail rabbits (Table 4). In 2007, the average age of small game license buyers was 42 years (Figure 2). Nearly 12% (35,159) of the license buyers were younger than 17 years old.

### Harvest and hunting trends

Significantly fewer hunters statewide pursued ring-necked pheasant (-19%), snowshoe hare (-30%), and squirrels (-15%) in 2007 than during 2006 (Table 4). Hunting effort statewide declined significantly among hunters pursuing pheasants (-40%) and squirrels (-24%)

between 2006 and 2007 (Table 5). Harvest also decreased significantly statewide for pheasant (-31%) and squirrels (-29%) between 2006 and 2007 (Table 6).

Coyotes could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). In 2007, an estimated 30,369 small game hunters pursued coyotes (Tables 4 and 7). About 28% of these hunters possessed only a small game hunting license (Table 7), and they were responsible for 34% of the coyotes taken by all small game license holders.

The number of small game hunters in Michigan has declined about 70% since the mid-1950s and is currently at a record low (Figure 3). This trend has been previously reported in Michigan and nationally (Brown et. al. 2000, Enck et al. 2000, Frawley 2006, U.S. Department of the Interior 2008). Hawn (1979) speculated declining ring-necked pheasant populations was the primary reason for declining small game hunter numbers in Michigan. The number of people hunting pheasants has declined by about 90% between the mid-1950s and recent years (Figure 4). Many other factors have contributed to the decline of small game hunting, including increased urbanization of the human population, increased competition between hunting and other leisure activities, and loss of wildlife habitat (Brown et al. 2000).

Declining small game hunting participation since the mid-1950s also has been noted among hunters pursuing cottontail rabbits (-75%), snowshoe hare (-75%), and squirrels (-60%)(Figure 4). Changes in hunter participation and harvest were generally similar.

Hunter numbers in the 1970s through the early 1980s were likely affected by the initiation and subsequent elimination of the put-take pheasant program (Figure 5). This program was created for the purpose of providing additional pheasant hunting opportunities. Each year while the program existed, pen-raised pheasants were released on several state properties in southern Michigan (Janson 1975, Janson and Anderson 1976).

Changes in the harvest of game species and hunter participation usually track changes in game populations. The number of hunters that pursued pheasants, rabbits, snowshoe hares, and squirrels was at record low levels during recent years (Figure 4). Game population surveys have indicated pheasant, quail, and woodcock populations are currently among their lowest recorded levels since the 1960s (Frawley and Stewart 2008, Cooper et al. 2008). The abundance of rabbit, hare, and squirrels was not monitored annually; thus, it was not possible to determine whether harvest and population trends were similar. Michigan's grouse population generally follows a cyclic pattern lasting about 10 years, and the grouse population in 2007 appeared to be increasing after reaching the low in the present cycle during 2004-2005 (Frawley et al. 2008). Hunter numbers and the number of grouse harvested have followed a similar cyclic pattern. The decline in crow hunters and their hunting effort in Michigan may reflect declining crow numbers as a result of the recent emergence of West Nile virus in North America (LaDeau et al. 2007).

Although many small game species are not as abundant today as during previous decades (e.g., pheasant, quail, woodcock), the mean number of animals taken per hunting effort has

not paralleled changes in the population (Figure 6). For example, hunting efficiency has been high among hunters despite declining numbers of pheasant and woodcock.

About 33% of the small game hunters in Michigan hunted on private lands only, 22% hunted on public lands only, and 40% hunted on both private and public lands (Table 8). Private lands served as the primary area for hunters pursuing pheasants, quail, cottontail rabbits, crows, and coyotes (Tables 8 and 9), while public lands were most popular among hunters pursuing grouse, woodcock, and snowshoe hares.

**Hunter satisfaction**

Compared to 2006 (Frawley 2007), a similar proportion of small game hunters in 2007 were satisfied with their overall small game hunting experience (66% versus 63% satisfied) (Table 10). Moreover, similar proportions of small game hunters were satisfied with the amount of small game seen (45% versus 44%) and small game harvested (36% both years).

**Migratory bird hunters and Harvest Information Program (HIP) compliance**

An estimated 80,770 ± 3,355 small game hunters hunted migratory birds (waterfowl and woodcock combined) in Michigan during 2007, compared to 81,949 ± 4,784 in 2006. An estimated 52,346 ± 2,888 hunters pursued waterfowl, and 37,875 ± 2,508 hunters pursued woodcock in 2007. The number of waterfowl and woodcock hunters in 2007 declined 10% and 4%, respectively, from 2006; however, neither decline was statistically significant.

Frawley (2008) had estimated 47,748 waterfowl hunters in Michigan during 2007 from the waterfowl harvest survey. In contrast, this current survey estimated 52,346 people hunted waterfowl. The previous estimate was obtained from a separate survey sent to a random sample of waterfowl license buyers and HIP registrants younger than 17 years old. The estimate from this small game harvest survey included a larger population of hunters, including many hunters that were not licensed to hunt waterfowl. This difference may partly account for the difference between the two estimates; however, differences also result from sampling error (see Methods).

In 2007, 90 ± 1% of migratory bird hunters had registered with HIP. About 97 ± 1% of the waterfowl hunters and 83 ± 3% of the woodcock hunters had registered with HIP. Compliance among hunters was unchanged from the rate of compliance in 2006 (Frawley 2007). Hunters registered with HIP were responsible for about 91% of the woodcock taken and 85% of the woodcock hunting trips done in 2007 (Table 11). Waterfowl hunters were not asked to report their harvest and hunting effort; thus, it was not possible to estimate harvest and effort for waterfowl among HIP registrants.

Cooper et al. (2008) reported estimates of harvest, hunter numbers, and hunting effort of Michigan woodcock hunters in 2007 from a USFWS survey. These estimates were based on responses received from a random sample of HIP registrants. Cooper et al. estimated 28,412 ± 3700 hunters went afield 138,881 ± 20,800 days and harvested 86,825 ± 14,800 woodcock. These estimates were less than estimates from the present survey (Tables 4-6).

Because nearly 15% of Michigan woodcock hunters failed to register with HIP, the estimates derived from the USFWS survey would be expected to be lower than estimates from the present survey. Estimates of harvest and hunter numbers derived from a subset of Michigan hunters that had registered with HIP (Table 11) were not significantly different from estimates from the USFWS survey; however, hunting effort estimates were significantly greater than estimated by the USFWS survey. This difference may reflect unknown differences in the way the surveys were implemented.

### Hunting with dogs

About 42 ± 2% of active small game hunters used dogs during 2007. Highest use of dogs occurred among hunters pursuing pheasant (64 ± 3%), woodcock (57 ± 4%), and quail (52 ± 18%). Dogs were also frequently used by hunters hunting snowshoe hare (41 ± 5%), grouse (40 ± 2%), and rabbit (34 ± 2%). Only 11 ± 2% of coyote hunters used dogs to hunt coyote.

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Table 1. Small game hunting seasons in Michigan, 2007-2008.

| Species, season, and area[a] | Season dates |
|---|---|
| Ring-necked pheasant | |
| Upper Peninsula (Zone 1) | Oct. 10 – 31 |
| Lower Peninsula (Zone 2) | Oct. 20 – Nov. 14 |
| Lower Peninsula (Zone 3) | Oct. 20 – Nov. 14 and<br>Dec. 1 – Jan. 1 |
| Northern bobwhite quail | |
| Southern Lower Peninsula | Oct. 20 – Nov. 14 |
| Ruffed grouse | |
| Statewide | Sept. 15 – Nov. 14 and<br>Dec. 1 – Jan. 1 |
| American woodcock | |
| Statewide | Sept. 22 – Nov. 5 |
| Cottontail rabbit | |
| Statewide | Sept. 15 – March 31 |
| Snowshoe hare | |
| Statewide | Sept. 15 – March 31 |
| Squirrels | |
| Statewide | Sept. 15 – March 1 |
| American crow | |
| Upper Peninsula | Aug. 1 – Sept. 30 |
| Lower Peninsula | Aug. 1 – Sept. 30 and<br>Feb. 1 – March 31 |
| Coyote | |
| Zones 1 and 2 | July 15 – Nov. 14 and<br>Dec. 1 – April 15 |
| Zone 3 | July 15 – April 15 |

[a]See Figure 1 for boundaries of hunt areas.

Table 2. Number of small game hunting licenses sold in Michigan, 2003-2007.

| Item | Year | | | | | 2006-2007 % Change |
|---|---|---|---|---|---|---|
| | 2003 | 2004 | 2005 | 2006 | 2007 | |
| Number of licenses sold[a] | 331,299 | 311,002 | 291,948 | 300,099 | 298,685 | -1 |
| Number of people buying a hunting license[b] | 327,071 | 306,526 | 287,562 | 295,369 | 293,662 | -1 |

[a]The number of licenses sold is higher than the number of people buying licenses because some people purchased multiple licenses.
[b]A person was counted only once, regardless of how many licenses they purchased.

Table 3. Estimated sex and age of active small game hunters in Michigan, 2003-2007.[a]

| Variable | 2003 | 2004 | 2005 | 2006 | 2007 | |
|---|---|---|---|---|---|---|
| | | | | | Estimate | 95% CL |
| Hunters[b] | 212,593 | 210,455 | 196,501 | 207,981 | 188,297* | 3,623 |
| Males (%) | 97.0 | 97.1 | 96.9 | 97.1 | 95.9 | 0.6 |
| Females (%) | 3.0 | 2.9 | 3.1 | 2.9 | 3.7 | 0.6 |
| Age (Years)[c] | 41.7 | 42.0 | 43.3 | 43.2 | 43.8 | 0.6 |

[a]Analyses included only those people that hunted.
[b]People that hunted American crow, American woodcock, cottontail rabbit, coyote, northern bobwhite quail, ring-necked pheasant, ruffed grouse, snowshoe hare, or tree squirrels. Coyote hunters were not included in estimate of small game hunters prior to the 2006 estimate.
[c]Mean age of active hunters on October 1.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly between the last two years (P<0.005).

Table 4. Estimated number of small game hunters by species and region in Michigan, 2004-2007.[a]

| Species and region | 2004 | 2005 | 2006 | 2007 No. | 2007 95% CL | 2006-07 % Change |
|---|---|---|---|---|---|---|
| Ring-necked pheasant[b] | | | | | | |
| UP | 1,454 | 1,352 | 3,004 | 2,019 | 618 | -33 |
| NLP | 20,865 | 21,386 | 19,691 | 16,331 | 1,630 | -17 |
| SLP | 38,859 | 36,014 | 36,964 | 30,218 | 2,232 | -18* |
| Statewide | 57,373 | 55,590 | 56,192 | 45,669 | 2,724 | -19* |
| Northern bobwhite quail | | | | | | |
| NLP | 556 | 649 | 256 | 279 | 205 | 9 |
| SLP | 1,562 | 2,964 | 2,462 | 1,455 | 466 | -41 |
| Statewide | 2,117 | 3,264 | 2,718 | 1,578 | 560 | -42 |
| Ruffed grouse | | | | | | |
| UP | 39,526 | 35,516 | 38,221 | 38,677 | 1,936 | 1 |
| NLP | 52,828 | 51,082 | 47,647 | 45,127 | 2,587 | -5 |
| SLP | 11,880 | 13,658 | 14,199 | 11,138 | 1,424 | -22 |
| Statewide | 96,117 | 92,428 | 92,698 | 88,727 | 3,206 | -4 |
| American woodcock | | | | | | |
| UP | 12,531 | 12,286 | 11,544 | 9,695 | 1,294 | -16 |
| NLP | 28,249 | 27,158 | 23,254 | 24,418 | 2,004 | 5 |
| SLP | 7,867 | 7,715 | 8,014 | 6,875 | 1,132 | -14 |
| Statewide | 44,525 | 43,286 | 39,618 | 37,875 | 2,508 | -4 |
| Cottontail rabbit | | | | | | |
| UP | 4,884 | 4,869 | 3,941 | 4,158 | 867 | 6 |
| NLP | 31,617 | 30,476 | 28,247 | 22,682 | 1,854 | -20* |
| SLP | 68,966 | 62,725 | 64,005 | 59,602 | 2,855 | -7 |
| Statewide | 99,503 | 91,525 | 89,703 | 82,647 | 3,353 | -8 |
| Snowshoe hare | | | | | | |
| UP | 10,468 | 11,392 | 10,243 | 8,911 | 1,223 | -13 |
| NLP | 11,940 | 11,033 | 11,976 | 6,739 | 1,081 | -44* |
| SLP | 1,289 | 1,554 | 2,322 | 1,412 | 518 | -39 |
| Statewide | 22,949 | 23,277 | 23,566 | 16,593 | 1,717 | -30* |
| Squirrels | | | | | | |
| UP | 6,114 | 5,210 | 4,305 | 6,329 | 1,047 | 47 |
| NLP | 39,457 | 38,602 | 41,965 | 32,967 | 2,198 | -21* |
| SLP | 58,243 | 53,288 | 58,476 | 48,435 | 2,661 | -17* |
| Statewide | 97,427 | 90,324 | 98,373 | 83,487 | 3,385 | -15* |
| American crows | | | | | | |
| UP | 1,816 | 1,293 | 1,283 | 1,079 | 452 | -16 |
| NLP | 6,532 | 7,471 | 4,582 | 4,859 | 918 | 6 |
| SLP | 9,953 | 10,858 | 8,558 | 7,924 | 1,214 | -7 |
| Statewide | 17,703 | 19,021 | 13,699 | 13,379 | 1,578 | -2 |
| Coyote | | | | | | |
| UP | NA | NA | 4,557 | 3,168 | 754 | -30 |
| NLP | NA | NA | 14,709 | 12,563 | 1,425 | -15 |
| SLP | NA | NA | 16,794 | 16,627 | 1,706 | -1 |
| Statewide | NA | NA | 33,182 | 30,369 | 2,300 | -8 |

[a]The number of hunters does not add up to the statewide total because hunters can hunt in more than one region.
[b]Included both regular and late pheasant hunting seasons.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 5. Estimated amount of small game hunter effort (days afield) by species and region, 2004-2007.

| Species and region | 2004 | 2005 | 2006 | 2007 No. | 2007 95% CL | 2006-07 % Change |
|---|---|---|---|---|---|---|
| Ring-necked pheasant[a] | | | | | | |
| UP | 7,034 | 6,956 | 17,728 | 11,024 | 5,320 | -38 |
| NLP | 86,561 | 87,349 | 73,670 | 57,056 | 8,703 | -23 |
| SLP | 175,842 | 170,933 | 149,123 | 109,096 | 12,408 | -27* |
| Statewide | 269,437 | 265,238 | 240,521 | 177,176 | 16,606 | -26* |
| Northern bobwhite quail | | | | | | |
| NLP | 1,700 | 3,658 | 970 | 2,048 | 1,901 | 111 |
| SLP | 5,145 | 9,466 | 8,172 | 3,663 | 1,917 | -55 |
| Statewide | 6,845 | 13,124 | 9,142 | 5,711 | 3,152 | -38 |
| Ruffed grouse | | | | | | |
| UP | 411,602 | 298,039 | 273,177 | 335,400 | 30,833 | 23 |
| NLP | 332,652 | 291,457 | 302,392 | 238,393 | 24,628 | -21 |
| SLP | 65,337 | 63,366 | 72,545 | 72,843 | 24,344 | 0 |
| Statewide | 809,591 | 652,861 | 648,114 | 646,636 | 46,302 | 0 |
| American woodcock | | | | | | |
| UP | 106,482 | 76,952 | 60,543 | 70,993 | 15,579 | 17 |
| NLP | 172,731 | 146,969 | 139,342 | 121,955 | 17,676 | -12 |
| SLP | 36,521 | 36,886 | 38,933 | 26,290 | 7,644 | -32 |
| Statewide | 315,734 | 260,807 | 238,819 | 219,238 | 25,537 | -8 |
| Cottontail rabbit | | | | | | |
| UP | 43,963 | 37,053 | 20,713 | 31,356 | 13,996 | 51 |
| NLP | 236,673 | 176,525 | 146,278 | 103,912 | 15,518 | -29 |
| SLP | 502,642 | 408,930 | 457,310 | 364,908 | 38,121 | -20 |
| Statewide | 783,277 | 622,508 | 624,301 | 500,176 | 45,233 | -20 |
| Snowshoe hare | | | | | | |
| UP | 82,961 | 86,254 | 51,238 | 77,972 | 25,795 | 52 |
| NLP | 88,711 | 53,472 | 72,704 | 37,577 | 9,915 | -48* |
| SLP | 6,479 | 7,776 | 12,828 | 6,861 | 4,021 | -47 |
| Statewide | 178,151 | 147,502 | 136,769 | 122,409 | 34,896 | -10 |
| Squirrels | | | | | | |
| UP | 59,363 | 31,883 | 47,745 | 56,052 | 19,449 | 17 |
| NLP | 273,883 | 217,342 | 324,200 | 171,061 | 22,324 | -47* |
| SLP | 378,893 | 321,882 | 357,930 | 323,983 | 48,309 | -9 |
| Statewide | 712,139 | 571,106 | 729,875 | 551,097 | 57,841 | -24* |
| American crow | | | | | | |
| UP | 10,266 | 8,581 | 4,574 | 6,477 | 4,803 | 42 |
| NLP | 33,664 | 28,820 | 13,388 | 31,143 | 14,773 | 133 |
| SLP | 69,872 | 42,323 | 30,139 | 37,229 | 14,097 | 24 |
| Statewide | 113,802 | 79,724 | 48,101 | 74,850 | 21,309 | 56 |
| Coyote | | | | | | |
| UP | NA | NA | 131,284 | 20,885 | 8,471 | -84 |
| NLP | NA | NA | 66,657 | 86,395 | 20,095 | 30 |
| SLP | NA | NA | 118,940 | 121,267 | 47,517 | 2 |
| Statewide | NA | NA | 316,881 | 228,547 | 54,357 | -28 |

[a]Included both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 6. Estimated small game harvest by species and region in Michigan, 2004-2007.

| Species and region | 2004 | 2005 | 2006 | 2007 No. | 2007 95% CL | 2006-07 % Change |
|---|---|---|---|---|---|---|
| Ring-necked pheasant[a] | | | | | | |
| UP | 1,208 | 2,111 | 7,841 | 3,765 | 2,144 | -52 |
| NLP | 35,603 | 35,560 | 29,214 | 22,317 | 4,356 | -24 |
| SLP | 64,647 | 56,346 | 57,703 | 39,736 | 5,885 | -31* |
| Statewide | 101,458 | 94,017 | 94,758 | 65,817 | 8,111 | -31* |
| Northern bobwhite quail | | | | | | |
| NLP | 227 | 577 | 0 | 74 | 105 | |
| SLP | 2,737 | 2,980 | 3,212 | 1,511 | 1,217 | -53 |
| Statewide | 2,964 | 3,557 | 3,212 | 1,585 | 1,341 | -51 |
| Ruffed grouse | | | | | | |
| UP | 119,183 | 105,564 | 154,473 | 193,227 | 20,931 | 25 |
| NLP | 90,028 | 94,109 | 101,793 | 100,163 | 13,098 | -2 |
| SLP | 16,720 | 15,625 | 14,568 | 9,667 | 3,174 | -34 |
| Statewide | 225,930 | 215,298 | 270,834 | 303,057 | 25,075 | 12 |
| American woodcock | | | | | | |
| UP | 26,556 | 37,743 | 40,167 | 31,623 | 8,083 | -21 |
| NLP | 71,219 | 67,168 | 70,748 | 72,233 | 15,146 | 2 |
| SLP | 18,898 | 16,525 | 23,221 | 8,983 | 4,514 | -61 |
| Statewide | 116,673 | 121,437 | 134,136 | 112,838 | 18,127 | -16 |
| Cottontail rabbit | | | | | | |
| UP | 17,227 | 9,206 | 7,438 | 8,248 | 3,437 | 11 |
| NLP | 101,699 | 76,337 | 74,707 | 58,268 | 9,659 | -22 |
| SLP | 393,882 | 334,276 | 358,970 | 299,430 | 33,824 | -17 |
| Statewide | 512,808 | 419,820 | 441,116 | 365,946 | 37,099 | -17 |
| Snowshoe hare | | | | | | |
| UP | 22,907 | 28,339 | 44,258 | 29,937 | 2,519 | -32* |
| NLP | 19,100 | 14,904 | 15,570 | 9,530 | 3,326 | -39 |
| SLP | 1,587 | 2,790 | 5,955 | 2,892 | 30,181 | -51 |
| Statewide | 43,594 | 46,033 | 65,783 | 42,360 | 10,609 | -36 |
| Squirrels | | | | | | |
| UP | 36,271 | 32,352 | 38,012 | 65,161 | 30,181 | 71 |
| NLP | 209,168 | 195,545 | 311,378 | 176,428 | 24,607 | -43 |
| SLP | 329,735 | 285,000 | 359,526 | 265,225 | 28,858 | -26* |
| Statewide | 575,174 | 512,898 | 708,917 | 506,814 | 49,704 | -29* |
| American crow | | | | | | |
| UP | 5,144 | 6,271 | 4,258 | 7,038 | 4,343 | 65 |
| NLP | 20,714 | 46,955 | 39,827 | 37,688 | 23,855 | -5 |
| SLP | 60,906 | 55,839 | 28,240 | 35,350 | 10,677 | 25 |
| Statewide | 86,764 | 109,066 | 72,325 | 80,076 | 27,104 | 11 |
| Coyote | | | | | | |
| UP | NA | NA | 3,869 | 4,530 | 3,089 | 17 |
| NLP | NA | NA | 9,762 | 17,567 | 6,417 | 80 |
| SLP | NA | NA | 19,599 | 14,387 | 4,784 | -27 |
| Statewide | NA | NA | 33,231 | 36,485 | 10,179 | 10 |

[a]Included both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 7. Estimated number of coyote hunters, coyotes harvested, and hunting effort (days afield) by small game hunters with and without a fur harvesters license in Michigan, 2007.[a]

| | Hunters | | Days afield | | Harvest | |
|---|---|---|---|---|---|---|
| Small game hunter group | No. | 95% CL | No. | 95% CL | No. | 95% CL |
| With fur harvesters license | 21,765 | 1,983 | 150,690 | 50,074 | 24,208 | 8,854 |
| Without fur harvesters license | 8,604 | 1,269 | 77,857 | 21,533 | 12,277 | 5,066 |
| Combined | 30,369 | 2,300 | 228,547 | 54,357 | 36,485 | 10,179 |

[a]Coyotes can also be taken by hunters possessing either a small game hunting or a fur harvesters license. These estimates do not include people with only a fur harvesters license that hunted coyotes.

Table 8. Estimated number and proportion of hunters hunting on private and public lands during the 2007 small game hunting season, summarized by species.

| | Land type | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Private land only | | | | Public land only | | | | Both private and public lands | | | | Unknown land | | | |
| Species | Total | 95% CL | % | 95% CL | Total | 95% CL | % | 95% CL | Total | 95% CL | % | 95% CL | Total | 95% CL | % | 95% CL |
| Ring-necked pheasant | 29,167 | 2,254 | 64 | 3 | 5,920 | 1,065 | 13 | 2 | 9,084 | 1,304 | 20 | 3 | 1,499 | 549 | 3 | 1 |
| Northern bobwhite quail | 602 | 345 | 38 | 17 | 486 | 311 | 31 | 16 | 328 | 257 | 21 | 15 | 162 | 182 | 10 | 11 |
| Ruffed grouse | 14,142 | 1,609 | 16 | 2 | 37,284 | 2,484 | 42 | 2 | 33,896 | 2,292 | 38 | 2 | 3,405 | 816 | 4 | 1 |
| American woodcock | 5,091 | 982 | 13 | 2 | 17,392 | 1,764 | 46 | 4 | 11,924 | 1,482 | 31 | 3 | 3,468 | 825 | 9 | 2 |
| Cottontail rabbit | 45,737 | 2,727 | 55 | 2 | 12,282 | 1,519 | 15 | 2 | 20,361 | 1,921 | 25 | 2 | 4,267 | 919 | 5 | 1 |
| Snowshoe hare | 3,135 | 778 | 19 | 4 | 6,130 | 1,077 | 37 | 5 | 5,636 | 1,030 | 34 | 5 | 1,691 | 577 | 10 | 3 |
| Squirrels | 36,487 | 2,493 | 44 | 2 | 21,106 | 1,954 | 25 | 2 | 21,381 | 1,962 | 26 | 2 | 4,514 | 938 | 5 | 1 |
| American crow | 7,441 | 1,193 | 56 | 6 | 2,037 | 632 | 15 | 4 | 3,226 | 781 | 24 | 5 | 675 | 364 | 5 | 3 |
| Coyote | 17,998 | 1,816 | 59 | 4 | 3,972 | 869 | 13 | 3 | 7,111 | 1,159 | 23 | 3 | 1,289 | 500 | 4 | 2 |
| Combined | 61,321 | 3,064 | 33 | 1 | 41,142 | 2,613 | 22 | 1 | 75,985 | 3,274 | 40 | 2 | 9,849 | 1,376 | 5 | 1 |

Table 9. Estimated number of days of hunting effort on private and public lands during the 2007 small game hunting season in Michigan, summarized by species.[a]

| | Land type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Private lands | | Public lands | | Both private and public lands | | Unknown | |
| Species | Total | 95% CL | Total | 95% CL | Total | 95% CL | Total | 95% CL |
| Ring-necked pheasant | 105,072 | 12,065 | 24,712 | 6,320 | 42,622 | 8,872 | 4,770 | 2,738 |
| Northern bobwhite quail | 2,617 | 1,931 | 1,135 | 1,068 | 1,310 | 1,601 | 650 | 1,262 |
| Ruffed grouse | 80,620 | 14,478 | 273,657 | 30,590 | 259,150 | 29,998 | 33,209 | 17,625 |
| American woodcock | 23,229 | 6,419 | 102,305 | 17,299 | 71,355 | 15,007 | 22,349 | 8,301 |
| Cottontail rabbit | 251,647 | 27,819 | 81,667 | 21,790 | 139,981 | 25,771 | 26,881 | 13,200 |
| Snowshoe hare | 16,029 | 6,183 | 32,494 | 9,456 | 50,702 | 24,658 | 23,185 | 22,134 |
| Squirrels | 214,042 | 35,842 | 134,467 | 25,585 | 175,033 | 36,796 | 27,556 | 9,155 |
| American crow | 39,056 | 17,275 | 9,011 | 4,675 | 22,624 | 10,208 | 4,159 | 5,518 |
| Coyote | 99,783 | 21,173 | 36,860 | 24,433 | 62,026 | 18,342 | 29,878 | 39,469 |

[a]People that hunted small game on both private and public lands were not asked to record the amount of effort separately for each land type; thus, it was not possible to estimate the total amount or proportion of effort devoted to either private or public lands separately.

Table 10. Level of satisfaction among active small game hunters (% of hunters) with the 2007 small game hunting season in Michigan.[a]

| | Level of satisfaction | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Very satisfied | | Somewhat satisfied | | Neutral | | Somewhat dissatisfied | | Very dissatisfied | |
| Index used to measure season satisfaction | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL | % | 95% CL |
| Small game seen | 15 | 1 | 29 | 2 | 21 | 1 | 21 | 1 | 13 | 1 |
| Small game harvested | 11 | 1 | 25 | 1 | 27 | 1 | 20 | 1 | 17 | 1 |
| Length of season | 34 | 2 | 29 | 2 | 27 | 1 | 7 | 1 | 3 | 1 |
| Overall experience | 31 | 2 | 36 | 2 | 20 | 1 | 8 | 1 | 6 | 1 |

[a]Analyses limited to small game license buyers that actually hunted in 2007 and indicated a level of satisfaction.

Table 11. Estimated number of Michigan woodcock hunters, woodcock harvested, and hunting effort (days afield) among people that registered with the Harvest Information Program, 2007.[a]

| Variable | No. | 95% CL |
|---|---|---|
| Hunters | 31,636 | 2,316 |
| Days afield (effort) | 186,062 | 23,518 |
| Harvest | 102,206 | 17,597 |

[a]Analyses limited to people that registered with HIP and hunted woodcock.

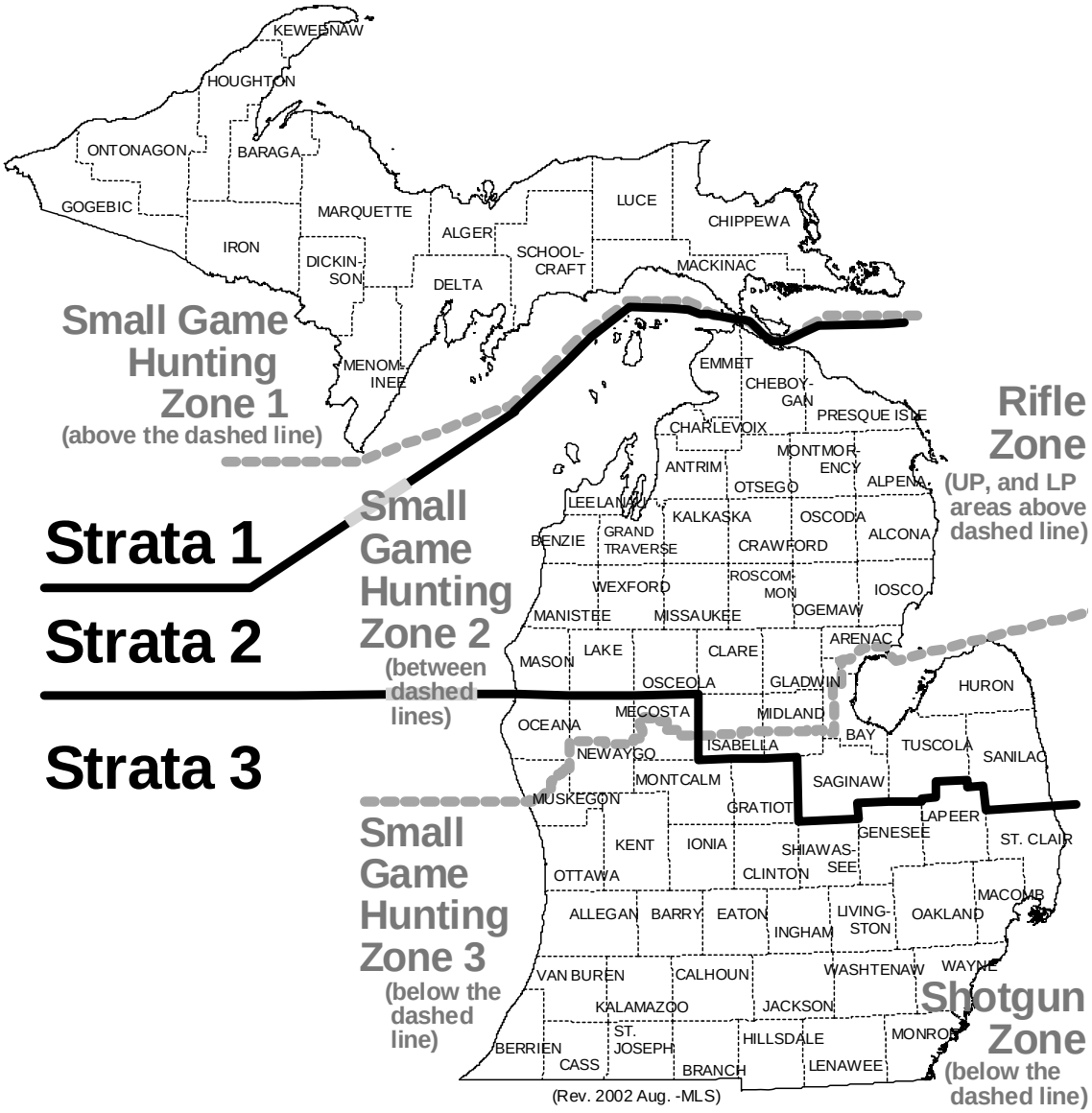


Figure 1. Areas (strata) used to summarize the survey data (top). Stratum boundaries did not match the small game management hunting zones.

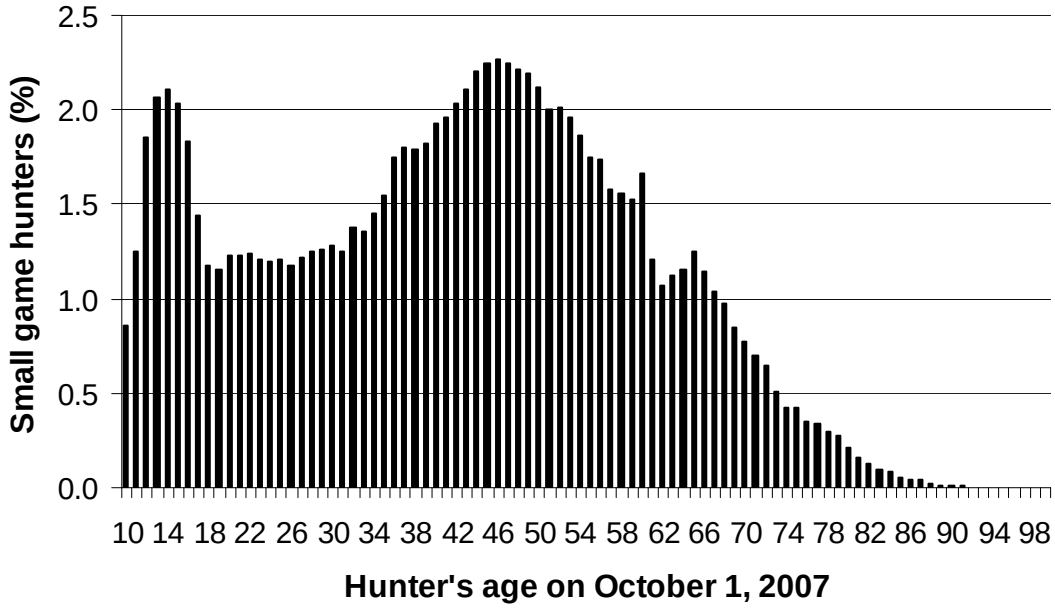


Figure 2. Age of people that purchased a small game hunting license in Michigan for the 2007 hunting seasons ($\bar{x}$ = 42 years).


Figure 3. Estimated number of small game hunters in Michigan, 1954-2007 (estimate of the number of people that went afield). No estimate was available for 1984.

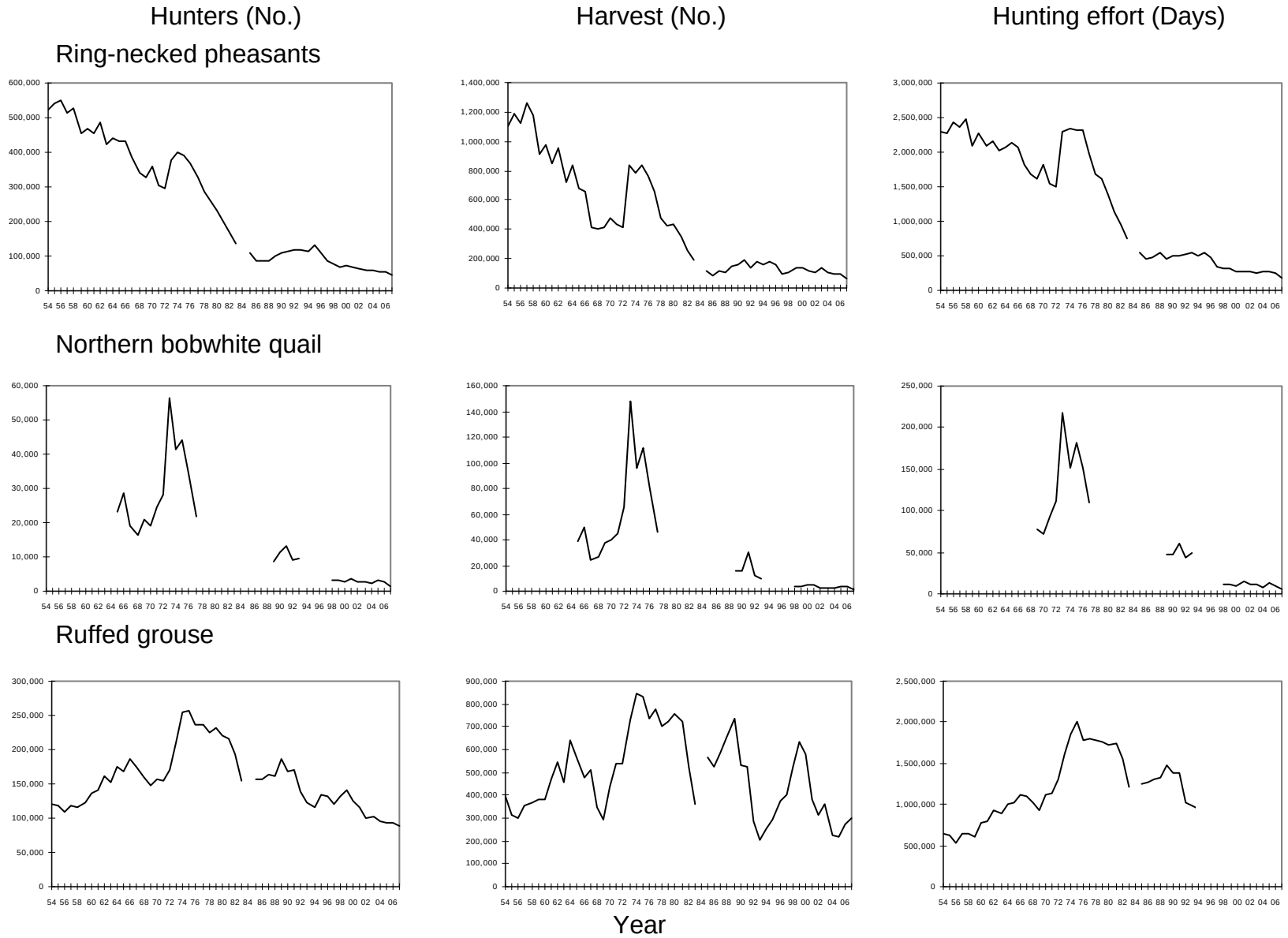


Figure 4. Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2007. No estimates were available or no seasons existed during years when no data are plotted.

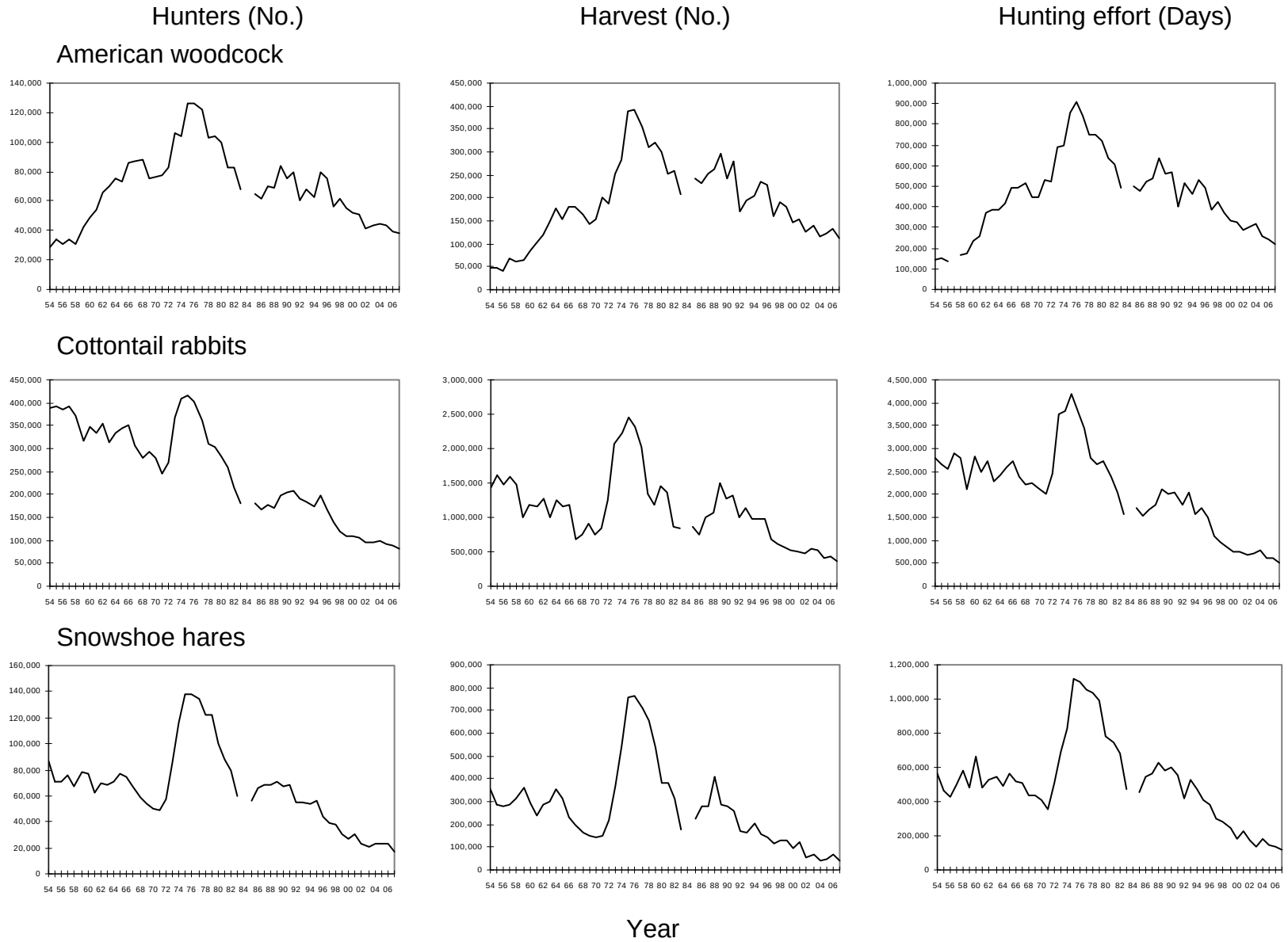


Figure 4 (continued). Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2007. No estimates were available or no seasons existed during years when no data are plotted.

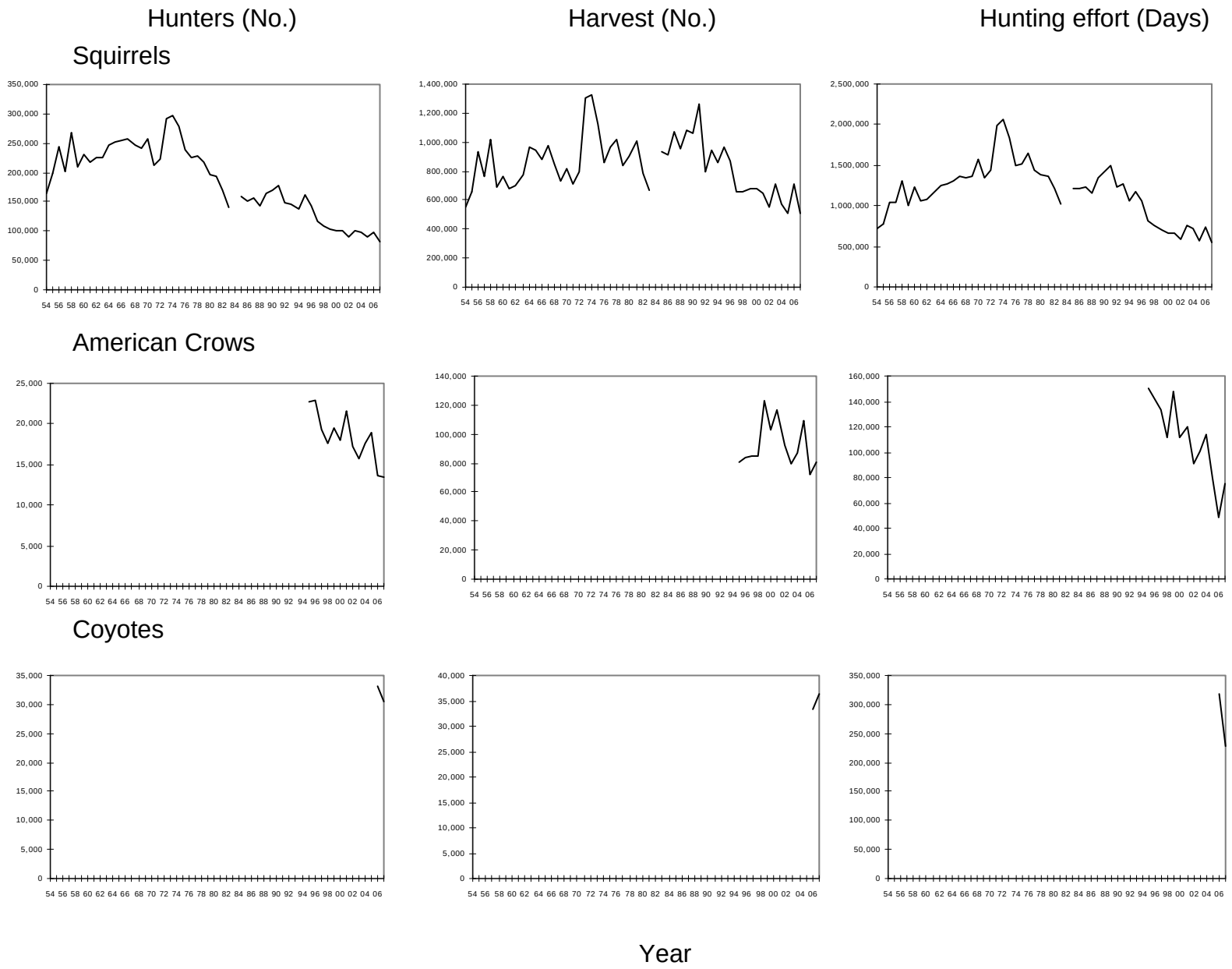


Figure 4. (continued) Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2007. No estimates were available or no seasons existed during years when no data are plotted.

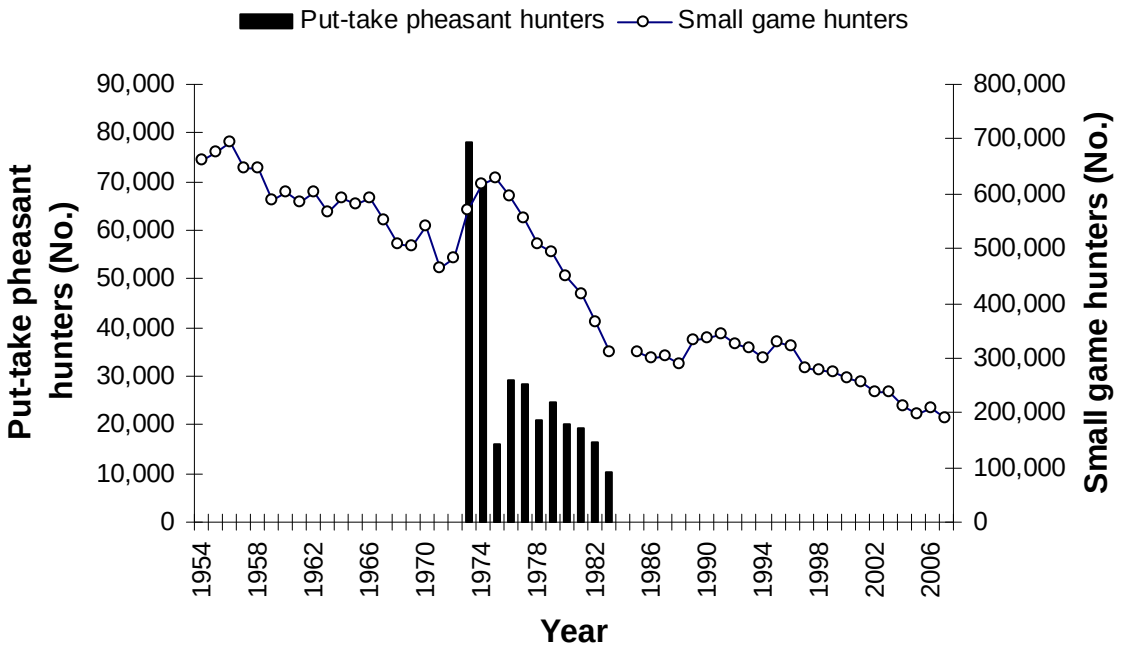


Figure 5. Estimated number of small game hunters in Michigan, 1954-2007 (estimate of the number of people that went afield) and number of people participating in put-take pheasant hunts (1973-1983). The numbers of put-take pheasant hunters were estimated for 1973-1974 (Janson 1975, Janson and Anderson 1976), while numbers of hunters during 1975-1983 were tallies of annual put-take permits sold (DNR, unpublished data). Thus, the estimates of put-take hunters during 1973-1975 and 1976-1983 periods are not directly comparable. No estimates of small game hunters or put-take pheasant hunters were available for 1984.

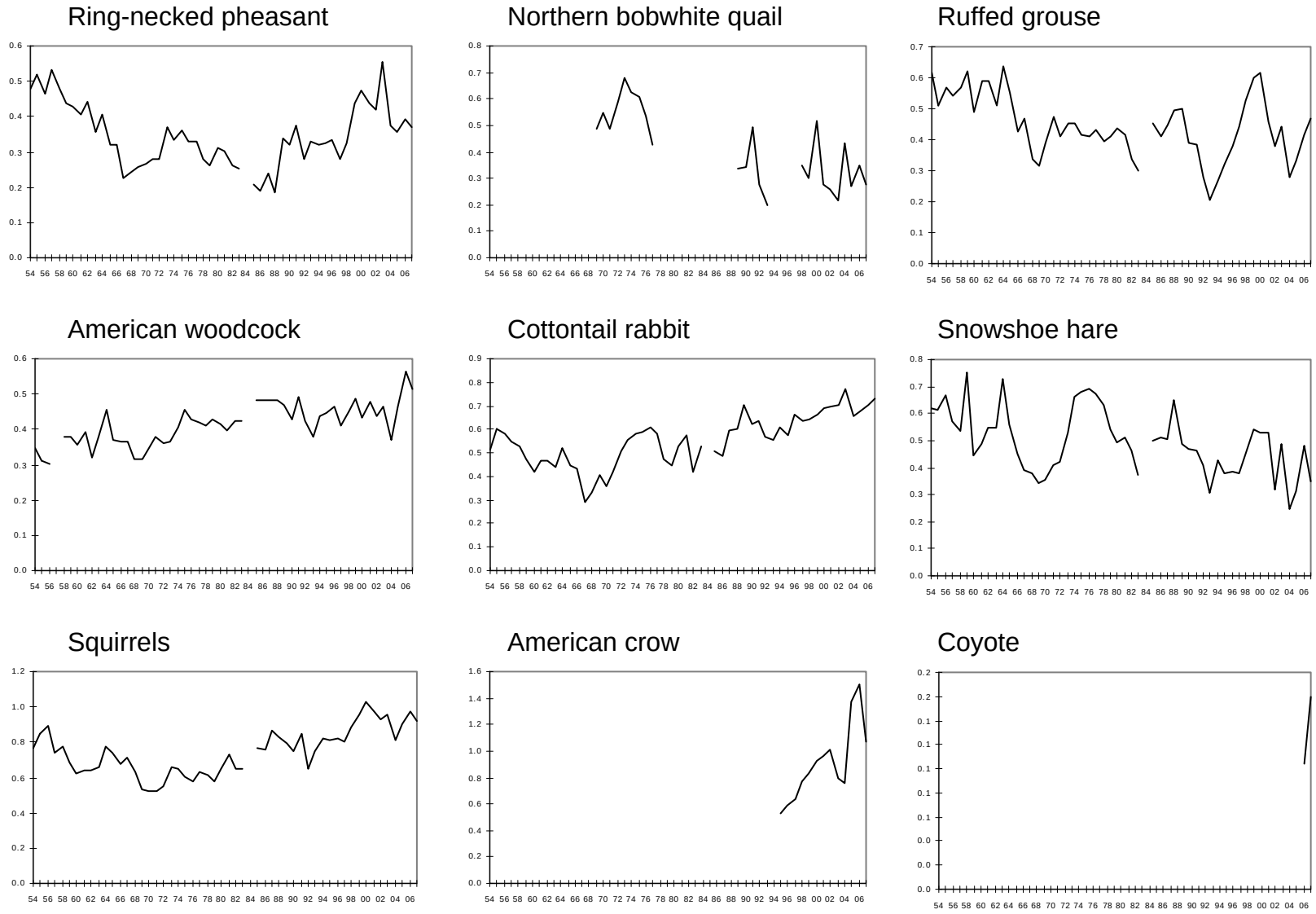


Figure 6. Estimated harvest per effort in Michigan during the small game hunting seasons, 1954-2007. No estimates were available or no seasons existed during years when no data are plotted.